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CURRENT LITERATURE.

Gray's Botanical Text-Book, Vol. II., Physiological Botany; i., Outlines of the Histology of Phanogamous Plants. By George Lincoln Goodale. Ivison, Blake-man, Taylor & Co., New York and Chicago, 1885.

In 1879 the first volume of this work appeared, and even at that time the claims of histology and physiology were so pressing that a second volume was set apart for their consideration, only as applied to phanerogams. The first part of this volume is before us now, but in the meantime some other text-books have appeared to meet this demand. An English translation of Sachs had already appeared, in 1880 both Bessey's Botany and Vines' edition of Prantl's Botany were published, and now we have the magnificent work of De Bary issued from the Clarendon Press, all these supplemented by foreign books. Into this goodly array we are exceedingly glad to welcome Dr. Goodale, for whose work many of us have been anxiously waiting. The second part is promised in the course of the year, and it is to be sincerely hoped that six more years will not elapse before Dr. Farlow's volume appears.

A first glance through the volume is decidedly refreshing, for we had become so accustomed to Sachs' figures staring at us from almost every page, that the new figures are very attractive. They have been well selected, in many cases from memoirs so inaccessible that they have all the flavor of originality, and pains seems to have been taken to avoid any "stock" figures.

In figures and text many structures have been presented more satisfactorily than ever before in an English book, and the summing up of contesting views, with the copious references to the literature of various subjects, make this part almost encyclopedic. The small space devoted to so great a subject will at first impress the special student unhappily, but conciseness has been the aim, and very much has been packed into these 170 pages, probably fully as much as would be proper when we consider the object of the text-book.

Dr. Goodale's classification of tissues is simple enough, which is certainly a thing to be much desired. It is surely a most perplexing thing to try to classify things which are not distinct and constantly intergrade. Whether Haberlandt's classification¹ upon a physiological basis, given by our author in his closing chapter, is going to stand, remains to be seen.

In the book before us four primary divisions are made, viz., parenchyma, prosenchyma, sieve-cells, and latex-cells. Of course the first two are taken in the most liberal sense, parenchyma including cells of the fundamental system under the three subdivisions of parenchyma cells proper (including collenchyma and sclerenchyma modification), epidermal cells, and cork-cells. Prosenchyma includes the cells of the fibro-vascular system, under the subdivision of prosenchyma proper (including wood fibres and tracheids), ducts, and bast-cells.

Whether botanists will consider prosenchyma as just the most suitable word in this connection is uncertain. It is certain that the classification has the merit of simplicity.

An introduction of 24 pages deals with histological appliances, treating in a very practical way such subjects as microscopes, dissecting instruments, media and reagents, staining fluids, etc. Chapter I presents the vegetable cell in general, its structure, composition, and principal contents. Chapter II is entitled Cells in their modifications and kinds, and the tissues they compose. Chapter III treats of the minute structure and development of root, stem, and leaf. Chapter IV contains the minute structure and development of the flower, fruit, and seed. Chapter V (the last) deals with the physiological classification of tissues, under the headings of division of labor in the plant, and me-

¹BOT. GAZETTE, x. p. 229.

chanics of tissues, which furnishes an easy transition to Part II, to be devoted to physiology. Those of us who have known Dr. Goodale as a teacher are familiar with his rare power of "putting things", a feature which is well carried out in the volume before us, but apparently somewhat repressed by the mass of details and the necessity of following a pattern already set. We look for the second part with great interest, for the first is simply introductory, and in the department of physiology Dr. Goodale finds his strength, and the science of botany some of its most interesting and difficult problems.

Bulletin of the Iowa Agricultural College, issued by the Department of Botany. Charles E. Bessey, Professor. November, 1884.

The Iowa Agricultural College is doing a commendable work in publishing a series of bulletins from the different departments of the College, for the cultivation of popular interest in the sciences related to agriculture. The third of the series, edited by Professor Bessey, is just printed, and forms a fitting monument to his work in the State he has recently left.

Two phænogams (*Crotalaria sagittalis* and *Stipa spartea*) are described and figured as of economic interest; the former affecting horses much as certain other leguminous weeds ("loco") do in the farther west; while the fruit of the latter is said to burrow into the flesh of sheep and other animals, as that of other grasses has been shown in nature to do elsewhere. An interesting peculiarity of this and other self-planting fruits (*Erodium*, etc.), which the writer has several times observed, does not seem to have been noticed, viz., a joint at the insertion of the awn, which softens in the damp soil, so that the awn is easily broken off by any force which might tend to withdraw the fruit. *Tilletia tritici*, *Ustilago segetum*, *U. Zeæ-mays*, and *Claviceps purpurea*, are illustrated and described as examples of noxious cryptogams.

The second part of the bulletin is occupied with two lists of cryptogams; the first, by Prof. Bessey, covering the vicinity of Ames; the second, by Mr. Arthur, including the Uredinæ and Ustilaginæ of the State. The character of the local flora may be gathered from the following summary based on the first list: Myxomycetes 18, Saccharomycetes 3, Bacteria 16, Cyanophyceæ 16, Chlorophyllophyceæ 5, Zoosporeæ 8, Desmids 4, Diatoms 7 (genera), Zygnemacæ 7, Mucorinæ 3, Oophyceæ 8, Saprolegniæ 2, Chytridinæ 3, Entomophthoræ 2, Peronosporæ 16, Perisporiaceæ 17, Pyrenomycetes 13, other Ascomycetes 15, Lichenes 24, Uredinæ 51, Ustilaginæ 16, Gasteromycetes 17, Hymenomycetes 65, Liverworts 6, Mosses 33.

While the list shows a great deal of industry on the part of the collector, the absence of critical notes, and the use of only the popular names of the hosts of parasitic species, must somewhat lessen its usefulness. A curious feature of the flora of the State is the entire absence of *Sphagnum* mosses, so far as is now known.

A most valuable part of the bulletin, for collectors and students, is the preliminary list of Uredinæ and Ustilaginæ, which comprises 135 species of the former (of which a dozen æcidia might have been connected with telentsporic forms), and 25 of the latter. It may be of interest to note that the same groups are represented, so far as is now known, by 100 and 21 species respectively in Wisconsin, and 46 and 6 in Kansas. The list of host-plants and localities adds much to the value of the list, and "every locality cited is represented by a specimen which may be the subject of further study at any time." Eight of the Uredinæ and two smuts are described as new, though it is doubtful if *Uromyces rudbeckiæ* A. & Holw. is really distinct from *U. solidaginis* Niessl., to which it has previously been referred.

Some fault might be found with the press-work and the large number of errors which have escaped correction in the bulletin; but every one who has dealt with the public printer must feel disposed to pass them by with a good deal of sympathy for the author, however annoying they may be.—T.

Contributions to the Botany of North America, XII By Asa Gray. From Proc. Am. Acad. xx. 257-310. Issued January 26, 1885.

The most important contribution is that which gives a revision of certain genera of *Borraginaceæ*. The large genus *Eritrichium* has suddenly collapsed, and its species have been scattered among three others, two of which had for some time appeared among its sections, and to the third *Eritrichium* itself has now been subordinated as a section. It has all come from putting too much confidence in "the degree of obliquity of the nutlets, of their extension above the gynobase, and of the extent of their attachment to it." From a tangled maze of characters ill-understood and misunderstood Dr. Gray has eliminated these results:

Omphalodes, Tourn., has nutlets attached above the base or ventrally, and with depressed back surrounded by a wing or margin which is revolute at maturity. To this *Eritrichium* is made a subgenus, including but two species, *O. nana* with vars. (*E. nana*, Schrad.) and *O. Howardi* (*Cynoglossum Howardi*, Gr.)

Krynitzkia, Fisch. & Meyer, has nutlets attached by the inner side of the base, or from this upward to the apex, on separation leaving a clean naked scar; and the nutlets are naked and convex on the back. This includes the greater number of species formerly marshalled under *Eritrichium*, such as belonged to the old sections *Krynitzkia*, *Eueritrichium*, *Myosotidea*, and *Antiphytum*. The number of necessary changes in nomenclature are too many to be enumerated here. It is sufficient to say that about all the old specific names have been retained, except that the most of *E. ciocarpum*, Watson, becomes *K. Torreyana*, and the rest of it is *K. leiocarpa*, F. & M., *K. affinis*, n. sp., *K. Watsoni*, n. sp., *K. Fendleri*, n. sp., which does very well for one species. To the genus are added eight new species, there being 46 in all.

Plagiobothrys, Fisch. & Meyer, has the nutlets attached by a small portion of the ventral face, by means of a sort of caruncle which comes off with the seed, leaving an excavation on the gynobase. This includes the species which appeared under *Eritrichium* & *Plagiobothrys*, and all of *Echidiocarya* except its original species, *E. Arizonica*. The typical species, *P. rufescens*, has at last turned up in North America, having been found in California. The genus numbers 14 species.

In the second part are given notes on some American species of *Utricularia*, suggested by an examination of the colored drawings made by Major John Le Conte to illustrate his memoir upon this genus. The drawings are now in the possession of Mr. I. C. Martindale.

In the third part are described six new genera, all from that prolific south-west of ours. Two of them, we are glad to see, commemorate our very good friends Dr. Rothrock and Mr. Pringle. The genera are *Veatchia* (*Anacardiaceæ*), from Lower California, discovered by Dr. J. A. Veatch; *Lyonothamnus* (*Rosacæ?*), from Sta. Catalina Island, California, discovered by Wm. S. Lyon; *Pringleophytum* (*Acanthaceæ*), from Sonora, Mexico, discovered by C. G. Pringle; *Phaulothamnus* (*Phytolaccaceæ*), from Sonora, Mexico, discovered by C. G. Pringle, a very interesting addition to a small order; *Himantostemma* (*Asclepiadaceæ*), from Sonora, Mexico, discovered by C. G. Pringle; and *Rothrockia* (*Asclepiadaceæ*), from S. Arizona, collected by Lemmon and Pringle.

Part four is mostly devoted to the description of new *Gamopetalæ*, chief among which must be mentioned a new species of *Schweinitzia*, from Florida, discovered by Miss Mary C. Reynolds, and bearing her name. Such an addition to a genus which was thought to be monotypic, and very peculiar at that, is a notable discovery. The other (*S. odorata*) ranges from Maryland to North Carolina.